

REMARKS

In response to the final Official Action of June 02, 2004, amendment has been made herein with regard to independent claim 15, which is believed to more particularly point out and distinctly claim that which applicant regards as their invention and in a manner which is believed to further distinguish the claimed invention over the cited art; namely, US Patent No. 998,567 (Fessenden) and US Patent No. 4,888,597 (Rebiez et al.). No new issues are believed to be raised as a result of this amendment. More particularly, claim 15 has been amended to state that the non-planar radiator surface is a *conductive* non-planar radiator surface.

Thus referring now to paragraph 2 of the Official Action, it is respectfully submitted that claims 15, 16, 18, 19, 22, 23, 24 and 26 are neither anticipated nor suggested by Fessenden. The Examiner is of the opinion that with respect to claims 15, 16, 23 and 24, Fessenden shows in Figure 1 an antenna 2 including a continuous non-planar radiator surface made up of wires 2 and connected to supports 1 and 4-9. In addition the Examiner states at paragraph 4 of the Official Action in the section entitled "Response to Arguments" that the wires of Fessenden certainly define an electrical surface for the current to flow and "[t]he wires simulate a continuous conductive surface, such as a cone." The Examiner is thus of the opinion that the wires form a much larger electrical surface and that the system of wires define such a surface. In response thereto, claim 15 has been amended to indicate that the non-planar radiator surface of the present invention is a non-planar *conductive* radiator surface. Even if one were to argue as the Examiner has that a plurality of wires can simulate a conductive surface, there is absolutely no physics known to the applicant which would provide for the emission of electromagnetic energy (i.e., photons) from the regions interposed between the wires of Fessenden. All electromagnetic energy radiating from or being received by the antenna of Fessenden is the result of such energy emanating from or being received on the wires disclosed in Fessenden and cannot be received nor emitted in the air space between such wires, which air space is a dielectric, not a conductor.

To the contrary, the antenna of the present invention has a conductive radiator surface which is continuous and which is non-planar. Thus, electromagnetic energy can be emitted or

received throughout this conductive radiator surface and not along imaginary wires. Clearly, the limitation as presented in amended claim 15 that the non-planar radiator surface is a conductive surface requires the radiator surface to be able to emit or receive electromagnetic energy throughout the entire radiator surface, which is clearly not possible with the wires forming the antenna shown in Fessenden. It is therefore respectfully submitted that claims 15, 16, 23 and 24 are neither anticipated nor suggested by Fessenden.

For similar reasons, claims 18, 19, 22 and 26 are also neither disclosed nor suggested by Fessenden since they depend from claim 15, which is believed to be distinguished over Fessenden.

Referring now to paragraph 3 of the Official Action, it is also respectfully submitted that the millimeter and submillimeter wave antenna structure shown in Rebiez et al. neither anticipates nor suggests claims 15-28 as amended herein. The Examiner at paragraph 3 states that the antenna 20 in Rebiez et al. includes a continuous non-planar radiator surface, for example, elements 47, 51, 52 and 58, which have variations in depth of the radiator surface and comprising indentations (Figure 3) in a planar ground plane 40 opposite the non-planar surface and defined by pyramids (Figure 3) in the radiator surface, as well as a planar dielectric surface 45 providing dielectric loading. The Examiner further comments at paragraph 4 of the Official Action that Rebiez et al. discloses that the entire horn radiator defines the antenna and that the planar microstrip probe is merely an end of a transmission line. Applicant's attorney respectfully submits that this interpretation of Rebiez et al. is incorrect. As set forth in applicant's amendment of March 15, 2004, Rebiez et al. discloses at column 3, lines 58-60, and column 4, lines 50-58, that the only antennas shown in Figure 2 are antennas denoted by reference elements 54, 59 and 64, and that the V-shape structures situated about each of these antennas 54, 59 and 64 form the horn for collecting received radiation and reflecting such radiation onto the respective antennas 54, 59 and 64. It is therefore clear that the V-shape structures of Rebiez et al. form reflectors for reflecting radiation to and from respective antennas 54, 59 and 64 as specifically pointed out at column 5, lines 26-32 of Rebiez et al.

In the present Official Action, the Examiner reiterates his arguments as presented in the Official Action of December 16, 2003; namely, that reference numerals 47, 51, 52 and 58 define an antenna including a continuous non-planar radiator surface. It is clear however that a review of the Rebiez et al. patent shows that these elements are not a continuous non-planar radiator surface, but rather are reflector surfaces. See, for example, column 4, lines 23-28, of Rebiez et al. where it clearly states that reference numerals 65, 70 and 75 refer to reflecting rear cavities, which in combination with front cavities 50, 55 and 60 form horns 92, 94 and 96. Such horn cavities and their reflecting surfaces including the reflecting rear cavity 65, 70 and 75 in no way disclose or suggest a non-planar conductive radiator surface such as set forth in amended claim 15.

Specifically, if one assumes the argument presented by the Examiner that the entire structure of Rebiez et al. represents an antenna, then it is clear that each of the radiator surfaces 54, 59 and 64 do not form a continuous surface as required by claim 15.

Furthermore, back substrate 40 in Rebiez et al. is not a planar ground plane as asserted in the Official Action. Rebiez et al. states that element 40 is a back substrate formed from a monolithic block of silicon of known thickness (see Rebiez et al., column 3, lines 34-37). There is no disclosure or suggestion that substrate 40 acts as a planar ground plane.

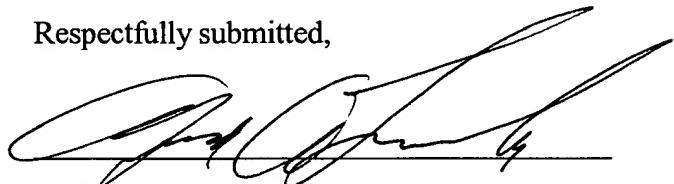
In short, it is not seen how the horn structure disclosed in Rebiez et al. in which a plurality of these horns are combined to form an overall millimeter and submillimeter wave antenna structure can be said to disclose or even suggest the continuous non-planar conductive radiator surface disclosed and claimed in the present invention. It is therefore respectfully submitted that claim 15 is neither disclosed nor suggested by Rebiez et al. and therefore the dependent claims thereto, namely, claims 16-28, are neither disclosed nor suggested by Rebiez et al.

CONCLUSION

For all of the foregoing reasons, it is respectfully submitted that the present application as amended is in condition for allowance, and such action is earnestly solicited. The Examiner is invited to contact applicant's attorney at the number below if there are any questions.

Applicant believes there is no fee due with this response; however, the Commissioner is hereby authorized to charge our deposit account, no. 23-0442, in the event any fee is due with this submission.

Respectfully submitted,



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